

BIOG 1001

Osmosis Worksheet

At the beginning of an osmosis experiment involving a U-tube, sides A and B contain aqueous solutions with the following solutes. Side A: 2 M* glucose, 0.1 M NaCl; Side B: 1 M glucose, 0.2 M NaCl. The volumes on either side of the tube are the same and thus the level of the liquid is at the same height in both arms. A selectively permeable membrane at the bottom of the tube separates the two sides. It is permeable to water and to NaCl but *not* to glucose. The apparatus is allowed to stand for a number of days.

*M = moles/liter

The following questions refer to this experiment. For each of these items, select the most appropriate phrase from the key below:

- A. Both the statement and the reason are true.
 - B. The statement is true, but the reason is false.
 - C. The statement is false, but the reason is an accepted fact or principle having no bearing upon the statement.
 - D. Both the statement and the reason are false.
- ___ 1. The glucose on side B will become less concentrated and that on side A more concentrated because a substance tends to diffuse from a less concentrated region to one of greater concentration.
 - ___ 2. The NaCl solution will become more concentrated on side A and less so on side B because sodium ions and chloride ions will pass through the membrane from a region of greater concentration to one of lesser concentration.
 - ___ 3. The glucose solution will become more concentrated on side B and less concentrated on side A because the glucose will diffuse through the membrane from a region of greater concentration to one of lesser concentration.
 - ___ 4. Glucose does not move across the membrane because the solution on side A is isotonic with the solution on side B.
 - ___ 5. The glucose solution of side A will become less concentrated and that on side B more concentrated because water will move by osmosis from side B to A, thus diluting side A.
 - ___ 6. The concentration of NaCl on side A will eventually equal that on side B because sodium and chloride ions will move by diffusion from one side to another until a uniform density is reached.
 - ___ 7. There will be a net movement of water from side A to side B because water will move from the hypertonic solution to the hypotonic solution when the two are separated by a selectively permeable membrane.
 - ___ 8. The passage of water through the membrane in this case is an example of osmosis because osmosis is defined as the net movement of water through a selectively permeable membrane.
 - ___ 9. The water level on side A will rise because the solution in side A had a higher osmotic concentration and thus a higher osmotic pressure than the solution in side B.
 - ___ 10. The passage of sodium and chloride ions through the membrane in this case is an example of osmosis because osmosis is defined as the passage of any substance through a selectively permeable membrane from a region of greater concentration to one of lesser concentration.

ANSWER KEY (DON'T PEEK!!!): 1-D, 2-A, 3-B, 4-B, 5-A, 6-A, 7-D, 8-A, 9-A, 10-D